MC0071

HOSPITAL BUILDING NOTE

10

KITCHENS

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DEPARTMENT OF HEALTH
AND SOCIAL SECURITY

HOSPITAL BUILDING NOTE NO. 10

Kitchens

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Appendix

Note of amendments made to 1961 edition

An addendum to Appendix E of Hospital Building Note No. 2, *The Cost of Hospital Buildings*, which sets out cost recommendations for Kitchens is supplied with this Building Note.

Hospital Building Note No. 2.

Appendix E

Kitchens

Hospital Building Note No. 10

The scales of accommodation and cost recommendations are applicable to all types of hospital.

Basic accommodation

(*a*) *Kitchen stores*
- (i) Meat/Fish cold store
- (ii) Vegetable store
- (iii) Day-to-day store
- (iv) Larder or cooling room
- (v) Kitchen cold room
- (vi) Equipment store
- (vii) Diet store
- (viii) Cleaners' room

(*b*) *Preparation areas*
- (i) Meat and fish preparation
- (ii) Pastry and sweet preparation
- (iii) Vegetable preparation
- (iv) Diet preparation

(*c*) *Cooking and service area*

(*d*) *Food trolleys*
- (i) Trolley park
- (ii) Trolley and container wash

(*e*) *Pan wash*

(*f*) *Staff accommodation*
- (i) Catering officer's office
- (ii) Dietitian's office
- (iii) Changing rooms
- (iv) Lavatories
- (v) Staff rest room

(*g*) *Refuse and swill disposal*
- (i) Bins
- (ii) Empties

(*h*) *Circulation space*—necessary for the above accommodation

Additional accommodation

(*a*) *Kitchen*
- (i) Catering clerk's office
- (ii) Chef's office
- (iii) Changing rooms and lavatories for dining-room staff

(*b*) *Bulk food store*
- (i) Reception
- (ii) Dry goods and issue store
- (iii) Bread store
- (iv) Milk store and dairy
- (v) Butchers' shop and cold rooms

(*c*) *Central wash-up for patients' dishes*

Circulation space. For the purpose of the provisional cost limit the area occupied by internal circulation space and internal walls and partitions represents, on average, an addition of 15 per cent to the net floor area of the basic and additional accommodation.

DEPARTMENTAL COST ALLOWANCES

1. Basic accommodation

Functional unit—a meal, in accordance with the definition of meals below:

Meals for this purpose are the maximum number of mid-day meals required for patients and staff, excluding staff on night duty and making allowance for a proportion of staff being on leave or off duty.

For the first 300 meals—
allow £24,500

For every additional meal—
allow £32

2. Additional accommodation

Cost of additional accommodation—

allow £5 16s. 0d. per square foot; except for the following:

Milk store and dairy—
allow £8 14s. 0d. per square foot;

Butchers' cold room—
allow £23 5s. 0d. per square foot.

Note: Engineering

The following engineering services are included in items (1) and (2) above and account for approximately 44-53 per cent of the total cost of basic and 30-32 per cent of the total cost of additional accommodation:

Space heating and ventilation; steam and condense; gas.

Hot, cold and drinking water.

Lighting, power, clocks, telephones and fire alarm system.

Kitchen equipment as in tables (1) and (1(*a*)) of Building Note No. 10 (including cold rooms for kitchen use and deep freeze based on 0.05 cu. ft. per main meal) and fire fighting equipment.

Note: Cost allowances have been revised and the above figures were operative from 1st May 1963.

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I. Scope

This building note gives guidance on the design of hospital kitchens to provide 300 to 1,500 meals, 'meals' for this purpose being the maximum number of mid-day meals required for patients and staff, excluding staff on night duty and making allowance for a proportion of staff being on leave or off duty. The information has been limited as it is intended to issue a Building Bulletin on this subject at a later date. This building note applies to all kinds of hospital.

II. General considerations

(*a*) *Generally*

It has been common practice to provide separate kitchens for staff and patients and in some hospitals even for differing types of staff and patients. One main kitchen serving all requirements is recommended.

In very large hospitals, however, 1,500 meals should be considered as the maximum to be served from one kitchen.

Kitchens should be planned to allow for the provision of a choice of dishes at each meal for both patients and staff and for the cooking of food in relays of smaller quantities. This will necessitate the provision of more items of equipment of smaller capacity than has been the custom in hospitals and this has been allowed for in the attached list of equipment. The Building Bulletin on hospital kitchens, which will be issued later, will deal with advantages and disadvantages of other catering practices such as a centralised tray service.

(*b*) *Site*

The design of the kitchen should not be determined by the structural pattern of other departments.

The kitchen should preferably be on the ground floor with staff dining-rooms on the same level. A top-floor kitchen is not advisable.

The following points should also be considered:

(i) The bulk stores entrance should be easy to approach, clearly defined and with adequate turning space. It should not interfere with the other hospital departments.

(ii) Siting should ensure that any noise or cooking odours emanating from the kitchen do not affect the other hospital departments.

(iii) Good natural light and ventilation is very desirable together with some regard to amenities of view and prospect for staff.

(*c*) *Access to wards*

It is essential that the position of the kitchen should permit of the delivery of food to the patients in the shortest possible time with the service exit from the kitchen as close as possible to the main circulation to the wards.

III. List of rooms

A. Basic accommodation

This should be provided in all cases and should consist of the following:

(*a*) *Kitchen stores*
- (i) Meat/fish cold store
- (ii) Vegetable store
- (iii) Day-to-day store
- (iv) Larder or cooling room
- (v) Kitchen cold room
- (vi) Equipment store
- (vii) Diet store
- (viii) Cleaners' room

(*b*) *Preparation areas*
- (i) Meat and fish preparation
- (ii) Pastry and sweet preparation
- (iii) Vegetable preparation
- (iv) Diet preparation

(*c*) *Cooking and service area*

(*d*) *Food trolleys*
- (i) Trolley park
- (ii) Trolley and container wash

(*e*) *Pan wash*

(*f*) *Staff accommodation*
- (i) Catering Officer's office
- (ii) Dietitian's office
- (iii) Changing rooms
- (iv) Lavatories
- (v) Staff rest room

(*g*) *Refuse and swill disposal*
- (i) Bins
- (ii) Empties

(*h*) *Circulation space* necessary for the above accommodation

Functional unit

The functional unit selected for the basic accommodation in this note and the related cost note (Appendix E to Building Note No. 2) is the meal, as defined under "Scope" above.

B. Additional accommodation

This is accommodation which may be required in addition to the basic:

(*a*) *Kitchen*

(i) Catering clerk's office

(ii) Chef's office

(iii) Changing rooms and lavatories for dining-room staff

(*b*) *Bulk food stores*

(i) Reception

(ii) Dry goods and issue store

(iii) Bread store

(iv) Milk store and dairy

(v) Butchers' shop and cold rooms

(*c*) *Central wash-up for patients' dishes*

IV. Description of rooms

Figure 1 shows the relationship of the various rooms in the basic and additional accommodation.

A. Basic accommodation

The Appendix gives a table of recommended net areas for the main groups of the basic accommodation for different meal numbers. For ease of reference these rooms have been listed under the main groups used above. For example, item 1, stores, includes the meat/fish cold store, the vegetable store, the day-to-day store, the larder, kitchen cold room and the equipment and diet stores. Where appropriate, recommended areas are given for the individual rooms. Circulation space between the groups is not included in any of the recommended areas.

(*a*) *Kitchen stores*

Generally, all stores including cold rooms should be at the same floor level to enable mobile racks to be used for storage.

(i) *Meat/fish cold store*

Meat store

This store should be adjacent to the meat preparation area. It should maintain a temperature of below 35° Fahrenheit and be a separate compartment from refrigeration provided for other foods, except possibly bacon. Fittings in the form of adjustable metal shelving and rails should be provided.

Fish store

Fish should be stored separately from all other foods. Normally a refrigerated cabinet, made for the purpose, in the fish preparation area (see (*b*)(i)) is most suitable.

(ii) *Vegetable store*

This is for potatoes, root and green vegetables, salads and fruit. It should be sited with good natural ventilation and with direct access to the service yard for deliveries and to the vegetable preparation area. The following are required: slatted platforms or duckboards with 6-in. clearance for sacks and adjustable metal racks. Fixed bins are not advisable.

(iii) *Day-to-day store*

This is required for the storage of groceries after daily issue from the main store together with ingredients, flavourings, etc., which are not issued on a daily basis; also stocks for use in emergencies or when the main store is closed. It should be sited with good natural ventilation, close to the preparation areas for pastry and meat/fish. Adjustable shelving should be provided with space for mobile racks.

(iv) *Larder or cooling room*

A larder is required for cooling cooked foods before refrigeration and storing prepared foods before cooking. It should be sited on the coolest side of the kitchen. (See V: Temperature controlled storage.) The kitchen cold room should be entered through the larder. Shelving with impervious surfaces and space for mobile racks is required.

(v) *Kitchen cold room*

Refrigerated space is required for the storage of cold cooked food and prepared food awaiting cooking or serving. Access should be through the larder (see (*a*)(iv)).

(vi) *Equipment store*

Storage is required for implements, machines, bowls and dishes, etc., not in daily use. For the smaller kitchen this may be provided as cupboards or racks, but generally a separate store room will be required in which case between 40 and 100 square feet will be needed. Equipment in daily use should be stored in preparation areas where it is used.

(vii) *Diet store*

This is the day-to-day store for the section in which special diets are prepared. It must be planned with the diet preparation area. It should contain a refrigerator. Between 50 and 100 square feet will be needed.

(viii) *Cleaners' room*

A ventilated cleaners' room is required with a bucket sink, drainer, locker and space for brooms, buckets and mechanical floor cleaner. Between 50 and 60 square feet will be required.

(*b*) *Preparation areas*

The preparation areas should be planned as work spaces in direct relationship to the cooking equipment. The equipment required within each work space should be sited to give the correct flow of work for the various food processes. Lavatory basins should be sited near the preparation areas.

(i) *Meat and fish preparation*

One area is required for the preparation of meat and fish, but the facilities for each should be separate. Sinks and worktops, a cold slab for fish, and storage for implements will be required.

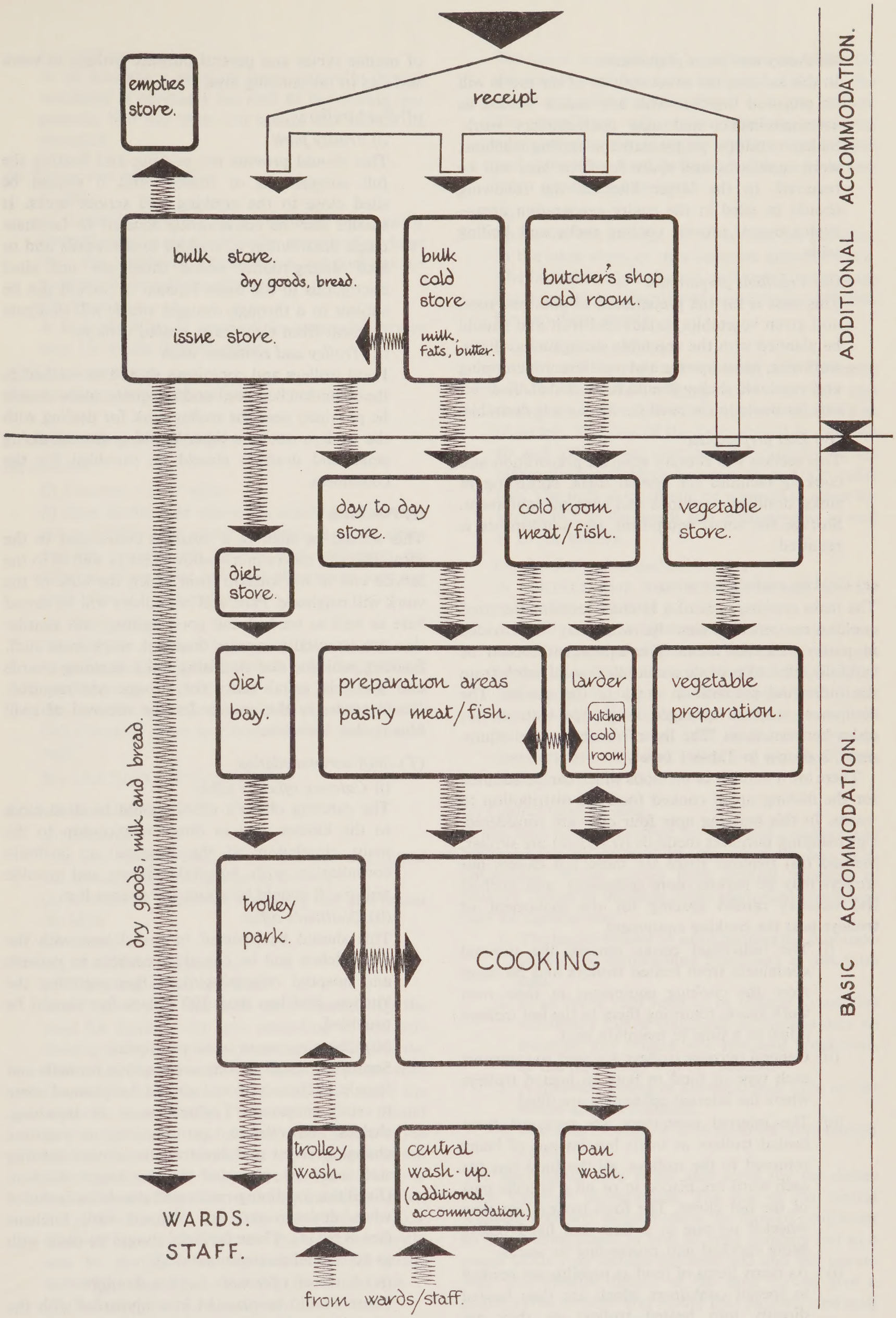

Figure 1. Diagram showing relationship of the various sections of the kitchen

(ii) *Pastry and sweet preparation*
In this section, the sweet courses of the meals will be prepared together with any sauces needed as accompaniments and also confectionery work Sinks, worktops, pastry slab and mixing machine, store cupboards and space for flour bins will be required. In the larger kitchens the following should be sited in the pastry preparation area—pastry ovens, prover, cooling racks and boiling table.

(iii) *Vegetable preparation*
This area is for the preparation of potatoes, root, and green vegetables, salads and fruit and should be planned with the vegetable storage area. Sinks, worktops, potato-peeler and machines for chipping and vegetable slicing should be provided. A direct exit for waste to the swill storage area is desirable.

(iv) *Diet preparation*
This section will contain separate preparation and cooking facilities for special diets, consisting of sinks, drainers, worktops and cooking equipment. Storage for small equipment and implements is required.

(*c*) *Cooking and service areas*
The main cooking area of a kitchen contains the fixed cooking equipment, except for what may be provided in pastry and diet areas. The equipment should be carefully sited to provide a smooth flow of work from the individual preparation areas to the service. The equipment may be arranged in groups with service aisles between them. The list of recommended equipment is shown in Table 1 below.

There are a number of methods which can be adopted for the dishing up of cooked food for distribution to wards. In this building note four only are considered. For planning purposes methods (i) and (ii) are similar, method (iii) requires space for more hot closets but trolleys may be parked more compactly and method (iv) requires careful spacing for the movement of trolleys past the cooking equipment.

(i) The individual cooks remove the internal containers from heated trolleys and fill them from the cooking equipment in their own work space, returning them to the hot trolleys a few at a time to maintain heat.
(ii) General purpose trolleys are used to transport each type of food in bulk to heated trolleys where the internal containers are filled.
(iii) The internal containers are removed from heated trolleys as in (i) but instead of being returned to the trolleys, all the food tins for each ward are placed in or on a specific part of the hot closet. The food trolleys are then wheeled up one at a time and filled before being checked and proceeding to wards.
(iv) As many items of food as possible are cooked in special containers which are then loaded directly into heated trolleys as they are wheeled one by one past the cooking equipment.

Generally, the aim should be to keep the layout as compact as possible. This is facilitated by the provision of mobile tables and general purpose trolleys as work surfaces in the cooking area.

(*d*) *Food trolleys*

(i) *Trolley park*
This should provide for parking and heating the full complement of trolleys and it should be sited close to the cooking and service areas. It should also be conveniently located to facilitate quick distribution of trolleys to the wards and to staff dining-rooms where these are not sited contiguous to the main kitchen. It should not be subject to a through draught which will dissipate the heat from electrically-heated trolleys.

(ii) *Trolley and container wash*
Food trolleys and containers should be washed in the main kitchen area and adequate space should be provided near the trolley park for dealing with the trolleys one at a time. Washing and sterilising sinks and drainers should be provided for the containers.

(*e*) *Pan wash*
This should be sited in a position convenient to the meat, fish and pastry preparation areas as well as to the service end of the kitchen from which the bulk of the work will originate. Pans and containers will be stored here as well as washed and good lighting and ventilation are essential to ensure thorough work from staff. Soaking, washing and sterilising sinks, draining boards and movable metal racks for storage are required. Direct access to the outside for the removal of swill bins is also desirable.

(*f*) *Staff accommodation*

(i) *Catering officer's office*
The catering officer's office should be sited close to the kitchen and in direct relationship to the main circulation of the hospital to facilitate consultation with hospital officers and outside visitors. It should be about 100 square feet.

(ii) *Dietitian's office*
This should be planned in association with the diet kitchen and be directly accessible to patients and hospital officers without their entering the kitchen. Not less than 100 square feet should be provided.

(iii) *Changing rooms, male and female*
Separate changing rooms are required for male and female kitchen staff and should be planned close to staff entrances. Lockers, seats or benching, shelves and mirrors, are required. A separate changing room and lavatory for senior catering staff may be provided in the larger kitchen. (Facilities for dining-room staff should be included when dining-rooms are planned with kitchens (see B.N. 11). These facilities should be dealt with as additional accommodation.)

(iv) *Lavatories for male and female staff*
These should be planned in conjunction with the changing rooms. The sanitary accommodation should be in the ratio of one fitting to eight persons, with lavatory basins planned en suite. Showers may be provided. (See note on dining-room staff at (iii) above.)

(v) *Staff rest room*

In all kitchens a separate room naturally lit and ventilated is necessary for staff to use during rest periods. Not less than 100 square feet should be provided.

(*g*) *Refuse and swill disposal*

(i) *Bins*

A covered, flyproof, well ventilated and easily cleaned space is required for the storage of garbage bins. Bin sterilising arrangements and facilities for washing down will be required.

(ii) *Empties*

A lockable store is required for returnable crates near the goods delivery point.

(*h*) *Circulation space*

Any corridors should be well lit and ventilated.

B. Additional accommodation

(*a*) *Kitchen*

(i) *Catering clerks' office*

In large kitchens or where the catering officer has responsibilities for other hospitals, a small office may be required for clerical staff, adjoining the catering office. Not less than 80 square feet per clerk should be provided.

(ii) *Chef's office*

This may be required in large kitchens and should have a clear view of the kitchen's activities. Natural ventilation and lighting are to be preferred. Not less than 80 square feet should be provided.

(iii) *Changing room and lavatories for dining-room staff*

See (A)(*f*)(iii) and (iv) above.

(*b*) *Bulk food store*

(i) *Reception*

The food commodities to be received and stored fall broadly into five groups as follows:

(*a*) Dry goods (groceries) including fats and bacon
(*b*) Milk
(*c*) Bread
(*d*) Meat, fish and poultry
(*e*) Fresh vegetables and fruit

The frequency of deliveries and consequently the need for storage will vary according to the purchasing policy adopted. All goods should enter the different stores through one reception point, with the exception of vegetables which should enter the vegetable store directly. The reception point should be planned separately from all other access to the kitchen. For large kitchens a loading dock at tail board height should be provided at the entrance to the bulk stores, together with a permanent position for platform scales. An office or reception cubicle of 60-80 square feet for the store-keeper should also be provided for supervision of all goods delivered and general control of the stores area.

(ii) *Bulk dry foods and issue store*

The bulk dry food store should be sited close to the delivery point and provide storage for heavy packaged food-stuffs and space for transference of contents to the issue store. Refrigerated space of 150-250 cubic feet is required for fats and bacon. The issue store should be planned to allow for dry goods and bread to be issued direct to the wards and dining-rooms as well as to the kitchen. The issue store will require adjustable shelving, adequate gangway space for trolleys, bench space and storage for ward baskets. A sink and lavatory basin should be provided.

(iii) *Bread store*

Space for the storage of bread can be provided in the issue store or in a separate adjacent store. The facilities required are a cool ventilated storage space containing shelving or mobile racks sufficient for two days' supply.

(iv) *Milk store and dairy*

A dairy will be required for daily milk deliveries with a refrigerated milk store for overnight and emergency stocks. Space for empty crates should be provided. The area of the dairy should be between 80 and 120 square feet and the capacity of the refrigerated milk store between 80 and 120 cubic feet. The milk store should be planned to allow for issue direct to the wards and dining-rooms as well as to the kitchen.

(v) *Butcher's shop and cold rooms*

A butcher's shop may be required and 200-350 square feet should be provided.

In this case a refrigerated store for carcase meat should be provided close to the stores' entrance so that carcases of meat can be off-loaded, weighed and placed directly in it. This should have direct access to the butcher's shop where the meat will be prepared and may need to have a separate compartment for fish if this is not provided in the kitchen.

(*c*) *Central wash-up area*

It has been normal practice for all ward crockery and tableware to be washed in the ward kitchen. The advantages to be gained from central washing of patients' dishes by machine under controlled conditions may be summarised:

1. The larger volume of work justifies the provision of efficient dishwashing machinery at less total cost.
2. Since fewer staff need to be trained to use this machinery higher standards of hygiene may be expected and misuse with resultant breakdown of the machinery will be reduced.
3. A material saving of domestic staff time on the wards may be expected.
4. Washing-up noise will be removed from patient areas.

The washing-up area could also serve for the dishes from the staff dining-room. The size of the central wash-up area will depend upon the type of equipment to be accommodated as well as meal numbers but as a rough guide may require between 600 and 900 square feet. The internal layout of the area should give a smooth flow of work and ensure that patients' and staff dishes enter the process at the same point.

The central wash-up area should be sited in relation to the main communications and staff serveries. Since it will be the noisiest area it is also desirable that consideration should be given to sound control.

TABLE 1
Hospital kitchen equipment

Number of mid-day meals	*300*	*400*	*500*	*750*	*1,000*	*1,250*	*1,500*	*Notes*
Steam ovens Number and capacity of compartments ...	3×3 cu. ft.	3×3 cu. ft. 2×4½ cu. ft.	3×3 cu. ft. 2×4½ cu. ft.	3×3 cu. ft. 2×4½ cu. ft. 1×9 cu. ft.	3×3 cu. ft. 2×4½ cu. ft. 1×9 cu. ft.	3×3 cu. ft. 2×4½ cu. ft. 2×9 cu. ft.	3×3 cu. ft. 2×4½ cu. ft. 2×9 cu. ft.	Dual pressure type preferred
Total capacity	9 cu. ft.	18 cu. ft.	18 cu. ft.	27 cu. ft.	27 cu. ft.	36 cu. ft.	36 cu. ft.	
Boiling pans Number and capacity	3×8/10 gal. 1×20 gal.	3×8/10 gal. 2×20 gal.	3×8/10 gal. 2×20 gal. 1×30 gal.	3×8/10 gal. 3×20 gal. 1×40 gal.	3×8/10 gal. 3×20 gal. 1×30 gal. 1×40 gal.	3×8/10 gal. 3×20 gal. 2×30 gal. 1×40 gal.	4×8/10 gal. 3×20 gal. 3×30 gal. 1×40 gal.	Includes stockpot
Total capacity	44/50 gal.	64/70 gal.	94/100 gal.	124/130 gal.	154/160 gal.	184/190 gal.	222/230 gal.	

Note. Where rectangular boilers are installed for unit cooking there should be a corresponding reduction in the capacity of steaming ovens and boilers.
Tilting pans should not exceed 30 gal. capacity.

a) Ovens Ranges, general purpose cabinet — Total capacity ... Number of ovens	30/32 cu. ft. 3/4	38/40 cu. ft. 4/5	45/48 cu. ft. 4/6	30/32 cu. ft. 3/4	30/32 cu. ft. 3/4	45/48 cu. ft. 4/6	45/48 cu. ft. 4/6	
b) Pastry oven — Size ... ... No. of decks	3 ft. 2	3 ft. 2	3 ft. 3	— —	— —	3 ft. 2	3 ft. 2	
c) Rotary ovens — capacity in standard bun pans (30ins. × 18ins.)	—	—	—	1×8 pan*	1×8 pan*	1×5 pan 1×6 pan	1×5 pan 1×6 pan	**Alternative* 1×5 pan rotary oven and 2×2 deck 3ft. pastry oven
d) Proving oven	—	—	1	1	1	1	1	
Boiling top — Kitchen 2-burner unit in pastry preparation ...	6 ft. —	9 ft. —	12 ft. —	12 ft. 1	12 ft. 1	12 ft. 1	12 ft. 1	Includes range tops
Fryers Deep fat	2 pan (18″×18″)	2 pan (26″×18″)	3 pan (26″×18″)	3 pan (26″×18″)	3 pan (26″×18″)	4 pan (26″×18″)	4 pan (26″×18″)	Quick heat type Dimensions indication of size only
Tilting shallow	1	1	1	2	2	2	2	

TABLE 1
Hospital kitchen equipment (continued)

Number of mid-day meals	*300*	*400*	*500*	*750*	*1,000*	*1,250*	*1,500*	*Notes*
Grills	2×32″	2×32″	2×32″	2×32″	2×32″	2×32″	2×32″	Length of opening.
Hot closets Total length ... ... Bain marie	6 ft. 3 ft.	8 ft. 3 ft.	8/12 ft. 3 ft.	12 ft. 3 ft.	12 ft. 3 ft.	18 ft. 6 ft.	18 ft. 6 ft.	
Instant water boiler— 2½ pints minimum	—	1	1	1	1	1	1	For kitchen use only.
Machines— Mixers†	30 quart	30 quart 20 quart	50 quart 30 quart	50 quart 30 quart	2×50 quart	2×50 quart	2×50 quart	Only electrically operated machines listed. Hand machines to be provided as required in small units.
Potato peelers	14 lb.	14 lb.	2×14 lb.	1×28 lb. 1×14 lb.	1×28 lb. 1×14 lb.	1×28 lb. 1×14 lb.	1×28 lb. 1×14 lb.	
Potato ricer	small	1	1	1	1	1	1	
Potato chippers	1	1	1	1	1	1	1	
Gravity feed slicers	1	1	1	2	2	2	2	
Vegetable shredders	1	1	1	1	1	1	1	
Pie machine—semi-automatic	—	—	—	—	1	1	1	
Refrigerated storage Total for kitchen and stores	300 cu. ft.	400 cu. ft.	500 cu. ft.	750 cu. ft.	1,000 cu. ft.	1,250 cu. ft.	1,500 cu. ft.	Includes provision for raw meat in joints. Greater capacity required if carcase meat is used. Deep freeze not included.
Including for kitchen use	75 cu. ft.	100 cu. ft.	125 cu. ft.	200 cu. ft.	300 cu. ft.	315 cu. ft.	375 cu. ft.	

†Makers' 'quart' capacities relate to U.S.A. measures.

TABLE 1 (a)
Diet kitchen equipment

Number of diets	*30–45*	*45–60*	*60–75*
Oven with boiling top Number and capacity of compartments	2×4–5 cu. ft.	2×6–7 cu. ft.	2×7–8 cu. ft.
Steam oven Number and capacity of compartments	—	1×3 cu. ft.	3×3 cu. ft.
Grill Length	18″	20″–24″	20″–24″
Mixing machine	6 pints	6 pints	10 quarts†
Liquidiser	1	1	2
Hot closet Approximate length	5 ft. (with 17 bain-marie)	6 ft. (with 21 bain-marie)	6 ft. (with 21 bain-marie)
Kettle, tilting, 3½ gal.	—	—	1

†Makers' 'quart' capacities relate to U.S.A. measures.

V. Engineering services

It is essential that the engineering services should be designed and installed to ensure ease of maintenance with the minimum interruption of services and disturbance to the working of the hospital whilst repairs are being carried out.

The need for meters for departmental costing purposes should be considered where these can be installed conveniently and inexpensively.

Equipment

Kitchen equipment should be chosen to meet the following requirements:

(i) efficiency;
(ii) suitability for the purpose;
(iii) ease of cleaning;
(iv) ease of handling and operation;
(v) low fuel consumption (where applicable);
(vi) ease of maintenance;
(vii) robust construction;
(viii) cost, compatible with (i) and (v) above.

Recommendations on the main items of equipment to be supplied are set out in Tables 1 and 1(a) above.

Mechanical services

Heating and Ventilating

General requirements

Table 2 below gives recommended design temperatures and ventilation rates based on an outside temperature of 30°F.:

TABLE 2

Accommodation	*Temperature*	*Air changes per hour*	*Notes*
Cooking area	—	25†	Mechanical ventilation.
Vegetable preparation	60°F	2	
Offices Catering, Stores, Diet	65°F	1½	
Staff room	65°F	2	
Cloak rooms and lavatories ...	60°F	2	
Stores: Main	60°F	2	
Day, Diet	55°F	2	To prevent dampness.
Linen	60°F	2	Heating coil from domestic hot water service.
Cleaners' room	50°F	½	
Pan wash	60°F	6	Mechanical extract ventilation.

†See 'Ventilating'.

The ventilation of kitchens should:

(i) ensure staff comfort;
(ii) prevent condensation;
(iii) prevent kitchen smells passing to other parts of the hospital.

Normally these objectives can be satisfied in the main cooking area only by a mechanical ventilation system.

Heating

The main cooking and preparation areas will require little or no heating during working hours. If the kitchen is in an exposed position some heating may be necessary to prevent overnight freezing. Ancillary rooms and working areas such as offices and cloakrooms, butcher's shop, vegetable preparation areas and wash-up will require heating in cold weather. Store rooms which are not continually occupied will only require sufficient heating to prevent dampness. A conventional hot water heating system using radiators or wall panels will be suitable for general heating in the kitchen.

Ventilating

The rate of air changes per hour will depend on the lay-out of equipment and the size and situation of the kitchen. Generally, a system of 25 air changes has been envisaged. It will usually be necessary to heat the incoming air to prevent kitchen staff being exposed to cold draughts. This may be done by means of unit heaters which should be thermostatically controlled to limit the air discharge temperature to 100°F. The heaters should be mounted at high level on or near external walls and be arranged to draw fresh air from the outside through suitable filters. By-pass dampers should be incorporated in the air intakes to enable the kitchen air to be recirculated and provide rapid initial heating at the start of the working day.

The air extract system should comprise a variable speed exhaust fan connected to a system of ducts with hoods or extract grilles located over cooking appliances and selected working areas. The system should be designed to extract between 10 and 20 per cent. more air than the mechanical inlet system provides, to ensure that air movement is towards the cooking area.

If the arrangement of the kitchen and its ancillary areas is unsuitable for a unit heater system, an inlet fan with filter and heater should be arranged to distribute ventilating air via a system of ducts to selected positions in the working areas.

Temperature controlled storage

Temperature controlled storage is to be considered in three categories:

(*a*) Larder or cooling room, maintained by controlled ventilation at below 50°F.
(*b*) Stores for perishable goods, bulk milk, and meat at 32°-35°F. with special sections at 29°-32°F. for bulk meat supplies delivered frozen for short-term use.
(*c*) Deep freeze cabinets in the range —10° to +10°F. for long-term storage and for the storage of quick-frozen foods.

Peak consumption of steam, gas and electricity

Table 3 below indicates the maximum hourly consumptions to be allowed initially for the kitchen sizes given. The final estimates should be made to suit the particular type of equipment selected.

TABLE 3

Main meals	*300*	*400*	*500*	*750*	*1,000*	*1,250*	*1,500*
Steam: lb.							
Kitchen equipment	400	500	600	900	1,100	1,300	1,400
Heating	200	275	350	450	550	625	700
Hot water supply*	100	125	150	200	250	310	375
Gas: Cubic feet (Based on a C.V. of 500 B.Th.U's per cubic foot) Kitchen equipment	950	1,100	1,250	1,600	1,900	2,150	2,250
Electricity: Kilowatts							
Kitchen equipment (includes electrically heated food trolleys and cold rooms)	10.0	13.0	16.0	24.5	32.0	39.5	47.0
Lighting and power (includes mechanical ventilation)	8.5	10.0	12.0	14.0	15.5	17.0	18.5

**N.B.* The hot water supply and the kitchen equipment peak loads will not necessarily coincide.

The kitchen equipment loads are based on the assumption that:

(i) steaming ovens, boiling pans and hot closets will be steam heated;
(ii) grillers, fish-fryers, ovens and separate boiling plates will be gas heated;
(iii) the remainder of the kitchen equipment will be electrically operated.

Domestic hot, cold and drinking water supplies

Domestic hot and cold water supplies should be provided to the lavatory basins, and sinks in the kitchen and cloakrooms, and to sinks in the pan-wash, cleaners' room and trolley and container wash.

Normally, water supplies will be taken from the hospital's main services, but where these are inadequate, local calorifiers and storage cisterns will be required. The temperature of hot water at the taps should be 130°-140°F. Local boosting will be necessary for sterilising sinks and dish-washing machines.

Drinking water taken directly from the service pipe will be required for the vegetable and food preparation sinks and the boiling pan filling connections. A tap for hosing-down is needed for the refuse and swill area.

TABLE 4

Main meals	*300*	*400*	*500*	*750*	*1,000*	*1,250*	*1,500*
Calorifier storage capacity: Gallons (Based on a two-hour recovery period)	200	250	300	400	500	625	750
Cold water cistern capacity: Gallons							
Half day's storage	750	850	1,000	1,250	1,500	1,750	2,000
Day's storage	1,500	1,700	2,000	2,500	3,000	3,500	4,000
Cold water: Gallons							
Peak demand—per hour	450	600	750	1,125	1,350	1,700	1,900

Table 4 above gives a guide to the amount of water required.

Steam and condensate services

These should be provided to the steam ovens, boiling pans, water boilers, bains-marie and the sterilising sinks in the pan-wash. Normally they will be connected to the hospital's main services, except for the condensate from the steam ovens, which should run to drain through grease traps. A steam supply for bin sterilising will also be needed.

Gas service

A gas supply will be required to ovens, boiling tops, grills and deep fat fryers. A separate check meter and meter cupboard should be provided.

Electrical installation

General

The electrical installation in the kitchen will include wiring and equipment for general and special lighting, socket outlets and equipment required for cooking appliances, heating, ventilating and clocks, telephones, call and fire alarm systems.

Wiring

Wiring enclosed in heavy gauge screwed steel conduit concealed in the building fabric where practicable, or mineral insulated metal cable, should be used. Where conduit is exposed to damp or steam conditions it should be heavily galvanised both inside and out, but preferably mineral insulated copper-clad cable systems should be used. The latter should be painted to prevent the formation of verdigris under damp conditions.

Lighting

The artificial lighting should be arranged to give an average illumination of 15 lumens per square foot at the normal working plane (i.e. 3 feet above floor level) and should be augmented by local lighting to 20 lumens per square foot for work requiring close examination. The illumination intensity variation factor for general lighting should not exceed 1.5.

Wherever possible fittings should be flush with the ceiling and should have smooth external surfaces. Where there is no alternative to the use of pendants, the fittings should be totally enclosed and should be suspended by conduit. Any flexible cables must be either tough rubber or P.V.C. sheathed. Condensation is a continuous hazard to fittings in the kitchen area. Any ferrous metals must be well protected to resist rusting and zinc base alloy or aluminium will corrode quite rapidly unless special precautions are taken.

It is essential that the lighting should give satisfactory colour rendering. Either tungsten or filament lamps or fluorescent lighting with double-coated tubes may be used.

The switching of lights should be arranged to give flexibility of control in half-light conditions. Local lighting should be locally switched.

Power and socket outlet circuits

Power supplies will be required to electric mixing machines, dish-washing machines, refrigerators and other electrical equipment. These machines should be provided with efficient means of starting and stopping, which should be easily accessible to the operator. (*N.B.* Very often these controls are 'built in' to the machine by the manufacturer.) In addition an isolator should be provided adjacent to each piece of equipment.

Power supplies with local means of isolation will also be required to the motors of the ventilating fans. The controls for these should incorporate an indicator lamp.

Sufficient 13 amp. universal type socket outlets on ring main circuits should be provided to allow for the convenient use of domestic appliances (e.g. floor cleaners) assumed to have 30 ft. flexible leads.

Switch room and distribution centre

The distribution switch gear for the kitchen should be centrally located to reduce the length of circuit wiring. It is preferable that the distribution equipment be housed in a room reserved specially for this purpose and large enough to allow a clear working space in front of the switch gear.

Electric clocks

Electric clocks will be required in the kitchen offices and the main cooking area. Where a central clock system exists it should be extended, otherwise synchronous mains operated clocks should be provided.

Telephones

Internal telephones should be provided in the kitchen and offices. The catering officer's and dietitian's offices should be provided with external telephones.

Fire alarms and fire-fighting equipment

Information on fire alarms and extinguishers is given in B.S. Codes of Practice and in the Ministry's circular 'Hospital Fire Precautions'. Advice on the fire-fighting installation proposed should be sought from the local fire brigade.

APPENDIX

Recommended areas for the different groups of accommodation.

Main meals	*300*	*400*	*500*	*750*	*1,000*	*1,250*	*1,500*
Stores IV A(*a*) (i)–(viii)	sq. ft. 350–400	sq. ft. 400–450	sq. ft. 500–600	sq. ft. 700–800	sq. ft. 800–850	sq. ft. 850–900	sq. ft. 900–950
Preparation IV A(*b*) (i)–(iv)	600–650	700–750	800–900	1,000–1,100	1,250–1,350	1,350–1,450	1,450–1,550
Cooking and service* IV A(*c*)	650–700	750–800	800–900	1,000–1,100	1,200–1,350	1,400–1,600	1,600–1,800
Trolleys* and trolley wash IV A(*d*) (i) and (ii)	250–300	300–350	450–550	600–700	700–800	800–900	900–1,000
Pan wash IV A(*e*)	130–150	140–160	150–180	180–230	230–260	230–260	230–260
Staff IV A(*f*) (i)–(v)	400–500	500–600	600–700	700–800	900–1,000	1,000–1,100	1,100–1,200

Note: Circulation spaces are not included.

*Although these areas are given separately, for planning purposes it is essential that they be considered together.

Amendments made to 1961 edition.

Pages 6, 7 and 8.

Tables 1 and 1(a) have been revised to bring into line with Hospital Equipment Note No. 10.

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